NUMERICAL STUDY OF PYROLYSIS AND FLAME SPREAD IN CORNER CONFIGURATIONS

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Abstract

The main goal of this study is to evaluate the predictive capabilities of FireFOAM in simulating pyrolysis and flame spread in corner configurations. This is pursued by comparison with experimental results from several Single Burning Item (SBI) tests performed by the authors with flammable boards of plywood and medium density fiber (MDF). Tests with inert Calcium Silicate boards served as reference cases, and material properties were available from Fire Propagation Apparatus (FPA) tests carried out at FM Global. This is a novel numerical study since this specific set-up, which is challenging and commonly used for flame spread scenarios, has not been studied with FireFOAM before. The study evaluates the capability of the sub-models in simulation of the ongoing pyrolysis and subsequently the flame spread in the corner configuration of SBI apparatus compared to the performed experiments. Measurements including through-thickness and backside temperatures all over the panels, the evolution of the total heat release rate and the evolution of heat fluxes at several points are available from the experiments which are compared against the simulations. The visual observations of the flame spread are available from a video camera which help evaluating the quality of the flame spread simulations.

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